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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,490	01/20/2004	John Targe Torvik	5098-1-1	4375
22442	7590	01/11/2006	EXAMINER	
SHERIDAN ROSS PC 1560 BROADWAY SUITE 1200 DENVER, CO 80202			BLUM, DAVID S	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/761,490

Applicant(s)

TORVIK, JOHN TARGE

Examiner

David S. Blum

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 47-65 is/are pending in the application.
- 4a) Of the above claim(s) 60-65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 47-60 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/20/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

This is in response to the application filed 1/20/04.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 47-60, drawn to a method of making a semiconductor device, classified in class 438, subclass 459.
 - II. Claims 61-65, drawn to a semiconductor device, classified in class 257, subclass 347.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the preferential etching layer could be made by diffusion or anodization rather than by implanting and the separation of the layer could be performed by cleaving rather than etching.

Group II claims are product by process claims. Even though product-by-process claims are limited by and defined by the process, determination of Patentability is based upon

Art Unit: 2813

the product itself. The patentability of a product does not depend on its method of production." MPEP 2113

3. During a telephone conversation with Douglas W. Swartz on 1/10/06 a provisional election was made without oral traverse to prosecute the invention of Group I, claims 47-60. Affirmation of this election must be made by applicant in replying to this Office action. Claims 61-65 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 47-53, 55, and 59-60 are rejected under 35 U.S.C. 102(b) as being anticipated by Yonehara (US005453394A).

Art Unit: 2813

Yonehara teaches all of the positive steps of claims 47-53, 55, and 59-60 as follows.

Regarding claim 47, Yonehara implants a preferential etching layer (102) within wafer 100, permanently attaches a substrate (110), and etches the preferential etching layer to separate the membrane from the wafer, wherein the wafer is less susceptible to the etchant than the preferential etching layer (column 6 lines 43-45).

Regarding claim 48, the preferential etching layer may be silicon oxide (column 4 line 57).

Regarding claim 49, the wafer is a semiconductor (column 7 lines 9-10, silicon is a semiconductor).

Regarding claim 50, the first wafer and the second substrate are firmly bonded to each other (column 7 lines 39-40), thus they are wafer bonded.

Regarding claim 51, the substrate of choice and the membrane are placed together prior to bonding, thus a crystalline construction of the substrate of choice is aligned to a crystalline construction of the membrane.

Regarding claims 52 and 55, a viscous flow-promoting layer (column 5 lines 58-61), thus a wetting layer) is intermediate the substrate of choice and the membrane. As the

Art Unit: 2813

substrate of choice and the membrane may be of like materials and the viscous flow-promoting layer is made by imparting softening impurities into a layer, both still have an element common to both.

Regarding claim 53, thermally oxidizing may take place at 1000 degrees C., which is at least 600 degrees C.

Regarding claim 59, the substrate of choice may be silicon (column 5 line 51).

Regarding claim 60, the etchant is hydrofluoric acid (column 6 line 44).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 54 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yonehara (US005453394A) in view of Doyle (US006054370A).

Yonehara teaches all of the positive steps of claims 54 and 56 as recited above in regard to claim 47, except for implanting oxygen to for the preferential etch layer.

Art Unit: 2813

Regarding claim 54, the Yonehara teaches oxygenating by anodizing and an etching step and that it is the oxidation of the layer that creates the preferential etching of that layer. Doyle teaches that oxygen may be implanted into silicon to alter the layer (column 3 line 48). Doyle uses implanting to control depth and direction of the defect areas.

Regarding claim 56, the membrane is heated to 1100, a temperature higher than the implanting temperature (Doyle does not report an elevated temperature for implanting oxygen).

It would be obvious to one skilled in the requisite art at the time of the invention to modify Yonehara by implanting oxygen as taught by Doyle to be a known method for forming the preferential etch layer and maintaining control over the depth of the defect region.

10. Claims 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yonehara (US005453394A) in view of Yamagata (US005250460A).

Yonehara teaches all of the positive steps of claims 57 as recited above in regard to claim 47, except for repeating the steps several times to provide a plurality of hybrid substrates.

Art Unit: 2813

Regarding claim 57, Yonehara implants a preferential etching layer (102) within wafer 100, permanently attaches a substrate (110), and etches the preferential etching layer to separate the membrane from the wafer, wherein the wafer is less susceptible to the etchant than the preferential etching layer (column 6 lines 43-45). Yonehara is silent as to reusing the substrates (repeating the steps). Yamagata forms a defect film region and then splits the film to create a thin film and teaches that it may be repeated several times (column 7 lines 23-25). Yamagata does not explain why the substrate would be used several times, only that it could be reused. One skilled in the art would recognize this as economizing to save money (reduced volume of raw materials).

It would be obvious to one skilled in the requisite art at the time of the invention to modify Yonehara by reusing the materials as taught by Yamagata. One skilled in the art would recognize this as economizing to save money (reduced volume of raw materials).

11. Claims 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yonehara (US005453394A) in view of Harris (US005798293).

Yonehara teaches all of the positive steps of claims 57 as recited above in regard to claim 47, except for using a silicon carbide wafer. Yonehara teaches by example a silicon wafer, and teaches other substrates may be used (column 5 lines 52-53, Quartz as an example, but this is not limiting). Harris teaches the use of a 3C-Sic wafer to improve leakage problems (column 3 lines 10-20).

Art Unit: 2813

It would be obvious to one skilled in the requisite art at the time of the invention to modify Yonehara by using a 3C-SIC wafer as taught by Harris to improve leakage problems (column 3 lines 10-20).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (571)-272-1687) and e-mail address is David.blum@USPTO.gov .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (571)-272-1702. Our facsimile number all patent correspondence to be entered into an application is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David S. Blum

January 10, 2006